22.16 continued

310 CMR 22.16 - Table 6
Violations and Other Situations Requiring Public Notice [1]

Contaminant	MCL/MRDL/TT violations [2]		Monitoring & testing procedure violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
I. Violations of National Primary Drinking Water Regulations[3] and 310 CMR 22.00				
A. Microbiological Contaminants				
1. Total coliform	2	310 CMR 22.05	3	310 CMR 22.05
2. Fecal coliform/E. coli	1	310 CMR 22.05	[4] 1, 3	310 CMR 22.05
3. Turbidity MCL	2	310 CMR 22.08 310 CMR 22.20A 310 CMR 22.20D	3	310 CMR 22.08 310 CMR 22.20A 310 CMR 22.20D
4. Turbidity MCL (average of 2 days' samples 5 NTU)	[5] 2, 1	310 CMR 22.08 310 CMR 22.20A	3	310 CMR 22.08 310 CMR 22.20A
5. Turbidity (for TT violations resulting from a single exceedance of maximum allowable turbidity level)	[6] 2, 1	310 CMR 22.08 310 CMR 22.20A 310 CMR 22.20D	3	310 CMR 22.08 310 CMR 22.20A 310CMR 22.20D
6. Surface Water Treatment Rule violations, other than violations resulting from single exceedance of max. allowable turbidity level (TT).	2	310 CMR 22.20A	3	310 CMR 22.20A
7. Interim Enhanced Surface Water Treatment Rule violations, other than violations resulting from single exceedance of max. turbidity level (TT).	2	[7]310 CMR 22.20D	3	310 CMR 22.20D
B. Inorganic Chemicals (IOCs)				
1. Antimony	2	310 CMR 22.06	3	310 CMR 22.06
2. Arsenic	2	310 CMR 22.06	3	310 CMR 22.06
3. Asbestos (fibers > 10 mm)	2	310 CMR 22.06	3	310 CMR 22.06
4.Barium	2	310 CMR 22.06	3	310 CMR 22.06
5. Beryllium	2	310 CMR 22.06	3	310 CMR 22.06
6. Cadmium	2	310 CMR 22.06	3	310 CMR 22.06
7. Chromium (total)	2	310 CMR 22.06	3	310 CMR 22.06
8. Cyanide	2	310 CMR 22.06	3	310 CMR 22.06
9. Fluoride	2	310 CMR 22.06	3	310 CMR 22.06
10. Mercury (inorganic)	2	310 CMR 22.06	3	310 CMR 22.06
11. Nitrate	1	310 CMR 22.06	[8] 1, 3	310 CMR 22.06
12. Nitrite	1	310 CMR 22.06	[8] 1, 3	310 CMR 22.06
13. Total Nitrate and Nitrite	1	310 CMR 22.06	3	310 CMR 22.06
14. Selenium	2	310 CMR 22.06	3	310 CMR 22.06
15. Thallium	2	310 CMR 22.06	3	310 CMR 22.06
C. Lead and Copper Rule (Action Level for lead is 0.015 mg/L, for copper is 1.3 mg/L)				
1. Lead and Copper Rule (TT	2	310 CMR 22.06B	3	310 CMR 22.06B
D. Synthetic Organic Chemicals (SOCs)				
1. 2,4-D	2	310 CMR 22.07A	3	310 CMR22.07A
2. 2,4,5-TP (Silvex)	2	310 CMR 22.07A	3	310 CMR22.07A
3. Alachlor	2	310 CMR 22.07A	3	310 CMR22.07A

22.16 continued

4. Atrazine	2	310 CMR 22.07A	3	310 CMR22.07A
5. Benzo(a)pyrene (PAHs)	2	310 CMR 22.07A	3	310 CMR22.07A
6. Carbofuran	2	310 CMR 22.07A	3	310 CMR22.07A
7. Chlordane	2	310 CMR 22.07A	3	310 CMR22.07A
8. Dalapon	2	310 CMR 22.07A	3	310 CMR22.07A
9. Di (2-ethylhexyl) adipate	2	310 CMR 22.07A	3	310 CMR 22.07A
10. Di (2-ethylhexyl) phthalate	2	310 CMR 22.07A	3	310 CMR 22.07A
11. Dibromochloropropane	2	310 CMR 22.07A	3	310 CMR 22.07A
12. Dinoseb	2	310 CMR 22.07A	3	310 CMR 22.07A
13. Dioxin (2,3,7,8-TCDD)	2	310 CMR 22.07A	3	310 CMR 22.07A
14. Diquat	2	310 CMR 22.07A	3	310 CMR 22.07A
15. Endothall	2	310 CMR 22.07A	3	310 CMR 22.07A
16. Endrin	2	310 CMR 22.07A	3	310 CMR 22.07A
17. Ethylene dibromide	2	310 CMR 22.07A	3	310 CMR 22.07A
18. Glyphosate	2	310 CMR 22.07A	3	310 CMR 22.07A
19. Heptachlor	2	310 CMR 22.07A	3	310 CMR 22.07A
20. Heptachlor epoxide	2	310 CMR 22.07A	3	310 CMR 22.07A
21. Hexachlorobenzene	2	310 CMR 22.07A	3	310 CMR 22.07A
22. Hexachlorocyclo-pentadiene	2	310 CMR 22.07A	3	310 CMR22.07A
23. Lindane	2	310 CMR 22.07A	3	310 CMR 22.07A
24. Methoxychlor	2	310 CMR 22.07A	3	310 CMR 22.07A
25. Oxamyl (Vydate)	2	310 CMR 22.07A	3	310 CMR 22.07A
26. Pentachlorophenol	2	310 CMR 22.07A	3	310 CMR 22.07A
27. Picloram	2	310 CMR 22.07A	3	310 CMR 22.07A
28. Polychlorinated biphenyls (PCBs)	2	310 CMR 22.07A	3	310 CMR 22.07A
29. Simazine	2	310 CMR 22.07A	3	310 CMR 22.07A
30. Toxaphene	2	310 CMR 22.07A	3	310 CMR 22.07A
E. Volatile Organic Chemicals (VOCs)				
1. Benzene	2	310 CMR 22.07B	3	310 CMR 22.07B
2. Carbon tetrachloride	2	310 CMR 22.07B	3	310 CMR 22.07B
3. Chlorobenzene (monochlorobenzene)	2	310 CMR 22.07B	3	310 CMR 22.07B
4. o-Dichlorobenzene	2	310 CMR 22.07B	3	310 CMR 22.07B
5. p-Dichlorobenzene	2	310 CMR 22.07B	3	310 CMR 22.07B
6. 1,2-Dichloroethane	2	310 CMR 22.07B	3	310 CMR 22.07B
7. 1,1-Dichloroethylene	2	310 CMR 22.07B	3	310 CMR 22.07B
8. cis-1,2-Dichloroethylene	2	310 CMR 22.07B	3	310 CMR 22.07B
9. trans-1,2-Dichloroethylene	2	310 CMR 22.07B	3	310 CMR 22.07B
10. Dichloromethane	2	310 CMR 22.07B	3	310 CMR 22.07B
11. 1,2-Dichloropropane	2	310 CMR 22.07B	3	310 CMR 22.07B
12. Ethylbenzene	2	310 CMR 22.07B	3	310 CMR 22.07B
13. Styrene	2	310 CMR 22.07B	3	310 CMR 22.07B
14. Tetrachloroethylene	2	310 CMR 22.07B	3	310 CMR 22.07B
15. Toluene	2	310 CMR 22.07B	3	310 CMR 22.07B
16. 1,2,4-Trichlorobenzene	2	310 CMR 22.07B	3	310 CMR 22.07B
17. 1,1,1-Trichloroethane	2	310 CMR 22.07B	3	310 CMR 22.07B
18. 1,1,2-Trichloroethane	2	310 CMR 22.07B	3	310 CMR 22.07B
19. Trichloroethylene	2	310 CMR 22.07B	3	310 CMR 22.07B
20. Vinyl chloride	2	310 CMR 22.07B	3	310 CMR 22.07B
21. Xylenes (total).....	2	310 CMR 22.07B	3	310 CMR 22.07B
F. Radioactive Contaminants				
1. Beta/photon emitters	2	310 CMR 22.09	3	310 CMR 22.09
2. Alpha emitters	2	310 CMR 22.09	3	310 CMR 22.09
3. Combined radium (226 & 228)	2	310 CMR 22.09	3	310 CMR 22.09

22.16 continued

G. Disinfection Byproducts (DBPs),Byproduct Precursors, Disinfectant Residuals. Where disinfection used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). EPA sets standards for controlling the levels of disinfectants and DBPs in drinking water, including trihalomethanes (THMs) and haloacetic acid (HAAs).[9]				
1. Total trihalomethanes (TTHMs)	2	310 CMR 22.07[10] 310 CMR 22.07E	3	310 CMR 22.07 310 CMR 22.07E
2. Haloacetic Acids (HAA5)	2	310 CMR 22.07E	3	310 CMR 22.07E
3. Bromate	2	310 CMR 22.07E	3	310 CMR 22.07E
4. Chlorite	2	310 CMR 22.07E	3	310 CMR 22.07E
5. Chlorine (MRDL)	2	310 CMR 22.07E	3	310 CMR 22.07E
6. Chloramine (MRDL)	2	310 CMR 22.07E	3	310 CMR 22.07E
7. Chlorine dioxide (MRDL) where any 2 consecutive daily samples at entrance to distribution system only are above MRDL	2	310 CMR 22.07E	2 [11], 3	310 CMR 22.07E
8. Chlorine dioxide (MRDL), where sample(s) in distribution system the next day are also above MRDL	[12] 1	310 CMR 22.07E	1	310 CMR 22.07E
9. Control of DBP precursors TOC (TT)	2	310 CMR 22.07E	3	310 CMR 22.07E
10. Bench marking and disinfection profiling	N/A	N/A	3	310 CMR 22.07E
11. Development of monitoring plan	N/A	N/A	3	310 CMR 22.07E
H. Other Treatment Techniques				
1. Acrylamide (TT)	2	310 CMR 22.04(10)	N/A	310 CMR 22.04(10)
2. Epichlorohydrin (TT)	2	310 CMR 22.04(10)	N/A	310 CMR 22.04(10)
II. Unregulated Contaminant Monitoring: [13]				
A. Unregulated contaminants	N/A	N/A	3	310 CMR 22.07C
B. Nickel	N/A	N/A	3	310 CMR 22.06
III. Public Notification for Variances and Exemptions:				
A. Operation under a variance or exemption	3	[14]310 CMR 22.13 310 CMR 22.14	N/A	N/A
B. Violation of conditions of a variance or exemption	2	[15]310 CMR 22.13 310 CMR 22.14	N/A	N/A
IV. Other Situations Requiring Public Notification:				
A. Fluoride secondary maximum contaminant level (SMCL) exceedance	3	310 CMR 22.06C	N/A	N/A
B. Exceedance of nitrate MCL for non-community systems, as allowed by the Department.	1	310 CMR 22.13 310 CMR 22.13A	N/A	N/A
C. Availability of unregulated contaminant monitoring data	3	310 CMR 22.07C	N/A	N/A
D. Waterborne disease outbreak	1	N/A	N/A	N/A
E. Other waterborne emergency [16].	1	N/A	N/A	N/A
F. Other situations as determined by the Department	[17] 1, 2, 3	N/A	N/A	N/A
G. Sodium	N/A	N/A	3	310 CMR 22.06A

Table 6 - Endnotes

1. Violations and other situations not listed in this table (e.g. ,reporting violations and failure to prepare Consumer Confidence Reports), do not require notice, unless otherwise determined by the Department. The Department may, at its option, also require a more stringent public notice tier (e.g., Tier 1 instead of Tier 2 or Tier 2 instead of Tier 3) for specific violations and situations listed in this Table, as authorized under 310 CMR 22.16(2)(a).

2. MCL-Maximum contaminant level, MRDL-Maximum residual disinfectant level, TT-Treatment technique.

22.16 continued

3. The term Violations of 310 CMR 22.00 is used here to include violations of MCL, MRDL ,treatment technique, monitoring, and testing procedure requirements.
4. Failure to test for fecal coliform or E. coli is a Tier 1violation if testing is not done after any repeat sample tests positive for coliform. All other total coliform monitoring and testing procedure violations are Tier 3.
5. Systems that violate the turbidity MCL of 5 NTU based on an average of measurements over two consecutive days shall consult with the Department within 24 hours after learning of the violation. Based on this consultation, the Department may subsequently decide to elevate the violation to Tier 1. If a system is unable to make contact with the Department in the 24-hour period, the violation is automatically elevated to Tier 1.
6. Systems with treatment technique violations involving a single exceedance of a maximum turbidity limit under 310 CMR 22.20A, the Surface Water Treatment Rule (SWTR), or 310 CMR 22.20D, the Interim Enhanced Surface Water Treatment Rule (IESWTR), are required to consult with the Department within 24 hours after learning of the violation. Based on this consultation, the Department may subsequently decide to elevate the violation to Tier 1. If a system is unable to make contact with the Department in the 24-hour period, the violation is automatically elevated to Tier 1.
7. Most of the requirements of the Interim Enhanced Surface Water Treatment Rule 310 CMR 22.20D become effective January 1, 2002 for surface water sources systems (surface water systems and ground water systems under the direct influence of surface water) serving at least 10,000 persons. However, 310 CMR 22.20D has some requirements that become effective as early as April 16, 1999. The Surface Water Treatment Rule, 310 CMR 22.20A, remains in effect for some systems serving at least 10,000 persons even after 2002; the Interim Enhanced Surface Water Treatment Rule, 310 CMR 22.20D, adds additional requirements and does not in many cases supercede the SWTR.
8. Failure to take a confirmation sample within 24 hours for nitrate or nitrite after an initial sample exceeds the MCL is a Tier 1 violation. Other monitoring violations for nitrate are Tier 3.
22.16:
9.Surface water sources systems (surface water systems and ground water systems under the direct influence of surface water) serving at least 10,000 persons (community and non-transient non-community systems) shall comply with the new DBP MCLs, disinfectant MRDLs, and related monitoring requirements beginning January 1, 2002. All other community and non-transient non-community systems shall meet the MCLs and MRDLs beginning January 1, 2004. Surface water sources systems (surface water systems and ground water systems under the direct influence of surface water) serving at least 10,000 persons transient non-community systems serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant shall comply with the chlorine dioxide MRDL beginning January 1, 2002. Surface water sources systems (surface water systems and ground water systems under the direct influence of surface water) serving at least 10,000 persons transient non-community systems serving fewer than 10,000 persons and using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant shall comply with the chlorine dioxide MRDL beginning January 1, 2004.
10. 310 CMR 22.07 will no longer apply after January 1, 2004.
11. Failure to monitor for chlorine dioxide at the entrance to the distribution system the day after exceeding the MRDL at the entrance to the distribution system is a Tier 2 violation.
12. If any daily sample taken at the entrance to the distribution system exceeds the MRDL for chlorine dioxide and one or more samples taken in the distribution system the next day exceed the MRDL, Tier 1 notification is required. Failure to take the required samples in the distribution system after the MRDL is exceeded at the entry point also triggers Tier 1 notification.
13. Some water systems shall monitor for certain unregulated contaminants listed in 310 CMR 22.07C.
14. This citation refers to 310 CMR 22.13 and 310 CMR 22.14 and requires that "a schedule prescribed . . for a public water system granted a variance [or exemption] shall require compliance by the system . ."
15. In addition, 310 CMR 22.13A specifies the items and schedule milestones that shall be included in a variance for small systems.
16. Other waterborne emergencies require a Tier 1 public notice under 310 CMR 22.16 (2)(a)7. for situations that do not meet the definition of a waterborne disease outbreak given in 310CMR 22.02(1) but that still have the potential to have serious adverse effects on health as a result of short-term exposure. These could include outbreaks not related to treatment deficiencies, as well as situations that have the potential to cause outbreaks, such as failures or significant interruption in water treatment processes, natural disasters that disrupt the water supply or distribution system, chemical spills, or unexpected loading of possible pathogens into the source water.
17. The Department may place other situations in any tier they believe appropriate, based on threat to public health.

22.16 continued

310 CMR 22.16 - Table 7
Standard Health Effects Language for Public Notification

Contaminant	MCLG[1] mg/l	MCL[2] mg/l	Standard health effects language for public notification
National Primary Drinking Water Regulations (NPDWR) and Massachusetts Drinking Water Regulations:			
A. Microbiological Contaminants:			
1a. Total coliform	Zero	See footnote[3]	Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, bacteria may be present. Coliforms were found in more samples coliform than allowed and this was a warning of potential problems.
1b. Fecal coliform/E. coli	Zero	Zero	Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
2a. Turbidity (MCL)[4]	None	1 NTU[5] 5 NTU	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.
2b. Turbidity (SWTR TT)[6]	None	TT[7]	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.
2c. Turbidity (IESWTR TT)[8]	None	TT	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.
Surface Water Treatment Rule (SWTR) and Interim Enhanced Surface Water Treatment Rule (IESWTR) violations:			
3. Giardia lamblia (SWTR/ IESWTR).			
4. Viruses (SWTR/IESWTR)..			Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.
5. Heterotrophic plate count (HPC) bacteria[9] (SWTR/IESWTR).			
6. Legionella (SWTR/IESWTR).			
7. Cryptosporidium (IESWTR).	Zero	TT[10]	
B. Inorganics			
8. Antimony	0.006	0.006	Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.

22.16 continued

9. Arsenic[11]	None	0.05	Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.
10. Asbestos (10µm)	7MFL[12]	7MFL	asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.
11. Barium	2	2	Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
12. Beryllium	0.004	0.004	Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions
13. Cadmium	0.005	0.005	Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.
14. Chromium (total).	0.1	0.1	Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.
15. Cyanide	0.2	0.2	Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.
16. Fluoride	4.0	4.0	Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.
17. Mercury (inorganic)	0.002	0.002	Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage
18. Nitrate	10	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
19. Nitrite	1	1	Infants younger than of six months old who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
20. Total Nitrate and Nitrite	10	10	Infants younger than of six months old who drink water containing nitrate and nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
21. Selenium	0.05	0.05	Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.
22. Thallium	0.0005	0.002	Some people who drink water containing thallium in excess of the MCL over many years

22.16 continued

			could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.
C. Lead and Copper Rule:			
23. Lead	Zero	TT[13]	Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.
24. Copper	1.3	TT[14]	Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.
D. Synthetic Organic Chemicals (SOCs):			
25. 2,4-D	0.07	0.07	Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands
26. 2,4,5-TP (Silvex)	0.05	0.05	Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.
27. Alachlor	Zero	0.002	Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.
28. Atrazine	0.003	0.003	Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties
29. Benzo(a)pyrene (PAHs).	Zero	0.0002	Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.
30. Carbofuran	0.04	0.003	Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.
31. Chlordane	Zero	0.002	Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.
32. Dalapon	0.2	0.2	Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.
33. Di (2-ethylhexyl)	0.4	0.4	Some people who drink water containing diadipate. (2-ethylhexyl) adipate well in excess of the MCL over many years could experience general toxic effects or reproductive difficulties
34. Di (2-ethylhexyl) phthalate	Zero	0.006	Some people who drink water containing di (2-ethylhexyl) phthalate in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may

22.16 continued

			have an increased risk of getting cancer.
35. Dibromochloropropane(DBCP).	Zero	0.0002	Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
36. Dinoseb	0.007	0.007	Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.
37. Dioxin (2,3,7,8-TCDD).	Zero	$3x10^{-8}$	Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
38. Diquat	0.02	0.02	Some people who drink water containing diquat in excess of the MCL over many years could get cataracts
39. Endothall	0.1	0.1	Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines
40. Endrin	0.002	0.002	Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.
41. Ethylene dibromide	Zero	0.00002	Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.
42. Glyphosate	0.7	0.7	Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.
43. Heptachlor	Zero	0.0004	Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.
44. Heptachlor epoxide	Zero	0.0002	Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.
45. Hexachlorobenzene	Zero	0.001	Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.
46. Hexachlorocyclopentadiene.	0.05	0.05	Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach

22.16 continued

47. Lindane	0.0002	0.0002	Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.
48. Methoxychlor	0.04	0.04	Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.
49. Oxamyl (Vydate)	0.2	0.2	Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.
50. Pentachlorophenol	Zero	0.001	Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.
51. Picloram	0.5	0.5	Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.
52. Polychlorinated biphenyls (PCBs).	Zero	0.0005	Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of cancer.
53. Simazine	0.004	0.004	Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.
54. Toxaphene	Zero	0.003	Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.
E. Volatile Organic Chemicals (VOCs):			
55. Benzene	Zero	0.005	Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of cancer.
56. Carbon tetrachloride	Zero	0.005	Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
57. Chlorobenzene (monochloro- benzene).	0.1	0.1	Some people who drink water containing chlorobenzene in excess of the MCL over many

22.16 continued

			years could experience problems with their liver or kidneys.
58. o-Dichlorobenzene	0.6	0.6	Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems
59. p-Dichlorobenzene	0.005	0.005	Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.
60. 1,2-Dichloroethane	Zero	0.005	Some people who drink water containing1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.
61. 1,1-Dichloroethylene	0.007	0.007	Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
62. cis-1,2- Dichloroethylene.	0.07	0.07	Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
63. trans-1,2- Dichloroethylene.	0.1	0.1	Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.
64. Dichloromethane	Zero	0.005	Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.
65. 1,2-Dichloropropane	Zero	0.005	Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.
66. Ethylbenzene	0.7	0.7	Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.
67. Styrene	0.1	0.1	Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.

22.16 continued

68. Tetrachloroethylene	Zero	0.005	Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.
69. Toluene	1	1	Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.
70. 1,2,4-Trichlorobenzene	0.07	0.07	Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.
71. 1,1,1-Trichloroethane	0.2	0.2	Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.
72. 1,1,2-Trichloroethane	0.003	0.005	Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.
73. Trichloroethylene	Zero	0.005	Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
74. Vinyl chloride	Zero	0.002	Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.
75. Xylenes (total)	10	10	Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.
F. Radioactive Contaminants:			
76. Beta/photon emitters	Zero	4 mrem/yr[15]	Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer.
77. Alpha emitters	Zero	15 pCi/l [16]	Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess the MCL over many years may have an increased risk of getting cancer.

22.16 continued

78. Combined radium (226 & 228).	Zero	5 pCi/l	Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.
G. Disinfection Byproducts (DBPs),Byproduct Precursors, Disinfectant Residuals. Where disinfection used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). EPA sets standards for controlling the levels of disinfectants and DBPs in drinking water, including trihalomethanes (THMs) and haloacetic acid (HAAs).[17]			
79. Total trihalomethanes (TTHMs)	N/A	0.10 0.080[18] [19]	Some people who drink water containing (TTHMs) trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.
80. Haloacetic Acids (HAA)	N/A	0.060[20]	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
81. Bromate	Zero	0.010	Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.
82. Chlorite	0.08	1.0	Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.
83. Chlorine	4 (MRDLG) [21]	4.0 (MRDL) [22]	Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.
84. Chloramines	4 (MRDLG)	4.0 (MRDL)	Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.
85a. Chlorine dioxide, where any 2 consecutive daily samples taken at the entrance to the distribution system are			Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects.

22.16 continued

above the MRDL.			Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. *Add for public notification only:* The chlorine dioxide violations reported today are the result of exceedances at the treatment facility only, not within the distribution system which delivers water to consumers. Continued compliance with chlorine dioxide levels within the distribution system minimizes the potential risk of these violations to consumers.
85b. Chlorine dioxide, where one or more distribution system samples are above the MRDL.	0.8 (MRCLG)	0.8 (MRDL)	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. *Add for public notification only:* The chlorine dioxide violations reported today include exceedances of the EPA standard within the distribution system which delivers water to consumers. Violations of the chlorine dioxide standard within the distribution system may harm human health based on short-term exposures. Certain groups, including fetuses, infants, and young children, may be especially susceptible to nervous system effects from excessive chlorine dioxide exposure.
86. Control of DBP precursors (TOC)	None	TT	Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.
H. Other Treatment Techniques:			
87. Acrylamide	Zero	TT	Some people who drink water containing high

22.16 continued

			levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.
88. Epichlorohydrin	Zero	TT	Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.

Table 7-Endnotes

1 MCLG-Maximum contaminant level goal

2. MCL-Maximum contaminant level

3. For water systems analyzing at least 40 samples per month, no more than 5.0% of the monthly samples may be positive for total coliforms. For systems analyzing fewer than 40 samples per month, no more than one sample per month may be positive for total coliforms.

4. There are various regulations that set turbidity standards for different types of systems, including 310 CMR 22.08, 310 CMR 22.20A, and 310 CMR 22.20D.

5. NTU-Nephelometric turbidity unit

6. There are various regulations that set turbidity standards for different types of systems, including 310 CMR 22.08, 310 CMR 22.20A and 310 CMR 22.20D. Systems subject to the Surface Water Treatment Rule (both filtered and unfiltered) may not exceed 5 NTU. In addition, in filtered systems, 95% of samples each month shall not exceed 0.5 NTU in systems using conventional or direct filtration and shall not exceed 1 NTU in systems using slow sand or diatomaceous earth filtration or other filtration technologies approved by the Department.

7. TT-Treatment technique

8. There are various regulations that set turbidity standards for different types of systems, including 310 CMR 22.08, 310 CMR 22.20A, and 310 CMR 22.20D. For systems subject to 310 CMR 22.20D (systems serving at least 10,000 people, using surface water or ground water under the direct influence of surface water), that use conventional filtration or direct filtration, after January 1, 2002, the turbidity level of a system's combined filter effluent may not exceed 0.3 NTU in at least 95% of monthly measurements, and the turbidity level of a system's combined filter effluent shall not exceed 1 NTU at any time. Systems subject to 310 CMR 22.20D using technologies other than conventional, direct, slow sand, or diatomaceous earth filtration shall meet turbidity limits set by the Department.

9. The bacteria detected by heterotrophic plate count (HPC) are not necessarily harmful. HPC is simply an alternative method of determining disinfectant residual levels. The number of such bacteria is an indicator of whether there is enough disinfectant in the distribution system.

10. 310 CMR 22.20A and 310 CMR 22.20D treatment technique violations that involve turbidity exceedances may use the health effects language for turbidity instead.

11. Arsenic: a new MCL of 0.01mg/l will be effective January 23, 2006. Until then, the MCL is 0.05 mg/L and there is no MCLG.

12. Millions fibers per liter.

13. Action Level = 0.015 mg/L

14. Action Level = 1.3 mg/L

15. Millirems per years

22.16 continued

16. Picocuries per liter
17. Surface water systems and ground water systems under the direct influence of surface water are regulated under 310 CMR 22.20A. Surface water sources systems (surface water systems and ground water systems under the direct influence of surface water) serving at least 10,000 persons community and non-transient non-community systems shall comply with DBP MCLs and disinfectant maximum residual disinfectant levels (MRDLs) beginning January 1, 2002. All other community and non-transient non community systems shall meet the MCLs and MRDLs beginning January 1, 2004. Surface water sources systems (surface water systems and ground water systems under the direct influence of surface water) serving at least 10,000 or more persons transient non-community systems using chlorine dioxide as a disinfectant or oxidant shall comply with the chlorine dioxide MRDL beginning January 1, 2002.

Surface water sources systems (surface water systems and ground water systems under the direct influence of surface water) serving fewer than 10,000 persons transient non-community systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant shall comply with the chlorine dioxide MRDL beginning January 1, 2004.
18. The MCL of 0.10 mg/l for TTHMs is in effect until January 1, 2002 for community surface water systems (surface water systems and ground water systems under the direct influence of surface water) serving 10,000 or more. This MCL is in effect until December 31, 2003 for community water systems with a population of less than 10,000 using only ground water not under the direct influence of surface water. After these deadlines, the MCL will be 0.080 mg/l. On January 1, 2004, all systems serving less than 10,000 will have to comply with the new MCL as well.
19. The MCL for total trihalomethanes is the sum of the concentrations of the individual trihalomethanes.20. The MCL for haloacetic acids is the sum of the concentrations of the individual haloacetic acids.
21. MRDLG-Maximum residual disinfectant level goal.
22. MRDL-Maximum residual disinfectant level.